ACCSCIENCE PUBLISHING

Materials Science in Additive Manufacturing

ORIGINAL RESEARCH ARTICLE

Cracking mechanism in single-pass molten pool of laser-directed energy deposition-manufactured FeCoCrNiAl high-entropy alloy coatings

Supplementary File

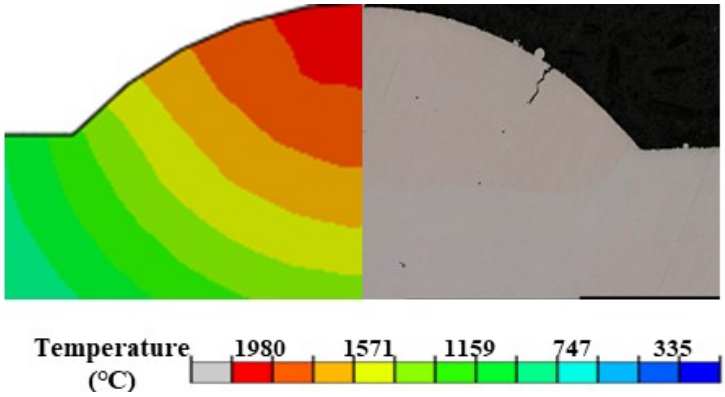

Figure S1. Model validity verification

Table S1. Thermophysical properties of the GCr18Mo steel and FeCoCrNiAl high-entropy alloy[1]

Item	Temperature (°C)	Thermal conductivity (W· (m·K) $^{-1}$)	Young's modulus (Pa)	Poisson's ratio	Expansion coeff (K^{-1})	Specific heat capacity (J· (kg·K) $^{-1}$)
GCr18Mo	20	40.4	1.93E+11	0.26	-	464
	200	38.2	1.86E+11	0.27	1.27E−05	497
	400	34.2	1.72E+11	0.27	1.40E−05	553
	600	30.5	1.53E+11	0.28	1.47E−05	671
	625	30.1	1.5E+11	0.28	1.47E−05	698
	650	29.9	1.47E+11	0.28	1.47E−05	734
	675	29.6	1.42E+11	0.29	1.48E−05	774
	700	29.3	1.37E+11	0.29	1.48E−05	824
	725	29.3	1.32E+11	0.29	1.49E−05	900
	750	29.9	1.26E+11	0.3	1.49E−05	1,020
	775	59	1.2E+11	0.29	1.43E−05	1,870
	800	50.9	1.15E+11	0.29	1.19E−05	1,490
	1,000	26.9	1.02E+11	0.38	1.64E−05	661
FeCoCrNiAl	-	16.2	1.99E+11	0.3	1.33E−05	481

Reference

1. Hu X, Zeng G, Chang L, Liu W, Hu Z, Zhang Q. Stress evolution and cracking mechanism in remelted region of laser direct energy deposition additively manufactured FeCoCrNiAl high entropy alloys. *Eng Fail Anal*. 2026;192:110810.

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